**Requirements Documentation**

**1. Project Overview**

**1.1 Project Name**

ITX TANKY

**1.2 Project Description**

A project that automate the Water pump machines by judging the water level of tank in houses. Also, detecting the water in the government’s water supply line. Also, Pumping water from ground level Tank to Roof Top Tank. And the app graphically displays the level of tanks and current water flow.

**2. Functional Requirements**

**Main Requirement:**

Project must be managing water tank to automate the water pump machine that fill the tank automatically. And also, show the status on mobile app.

**Components of Main Requirement:**

1. A module that will handle and detect the water level of tank.
2. A module that will operate the water pump machine.
3. A mobile app that shows the current status of both water tank and pump machine.
4. A server module that connects the module with each other.
   1. **Requirement 1:**

A module that will handle and detect the water level of tank.

**2.1.1 Description**

This module will use three main things Arduino, Ultrasonic sensor, wifi module.

**Arduino:**

It is the main component that operates both Ultrasonic sensor and wifi module and uses both. And Also, stores the program in the Chip.

**Ultrasonic sensor:**

This component detects the water level and informs to Arduino about water level. The maximum range of HC-SR04 is 13 foot.

**Wifi module:**

This component allows the Arduino to interact with the wifi and connects to the mobile app and pump machine.

**2.1.2 Functionality:**

- makes connection with server module.

- inform the status of water tank on server module.

**2.1.3 Conditions:**

**-** when program starts, it makes connection.

**-** when water level is 100%, then sends the stop command to server module.

- when water level reach to the sensor at 5 cm, it sends the stop command to pump machine. (for Safety)

**2.2 Requirement 2:**

A module that will operate the water pump machine.

**2.2.1 Description**

This project will use three main things Arduino, water sensor, wifi module and relay module.

**Arduino:**

It is the main component that uses and operates water sensor, relay module and wifi module. And Also, the program stores in the Arduino Chip.

**Water sensor:**

This component senses the water and informs to Arduino about water.

**Relay module:**

This component operates the pump machine.

**Wifi module:**

As described in section **2.1.1 Wifi module**

**2.2.2 Functionality:**

**-** makes connection with server module.

- start and stop the water pump.

- senses the water from the source.

**2.2.3 Conditions:**

**-** when program starts, it makes connection.

**-** start and stop the machine when command receive.

**2.3 Requirement 3:**

A mobile app that shows the current status of water tanks.

**2.3.1 Description**

This application will create on android studio with backend language JAVA and frontend language XML.

**2.3.2 Functionality:**

**-** shows the status of water tank.

- starts the pump manually.

- edits the tanks info.

**2.4 Requirement 4:**

A server module that connects the modules with each other.

**2.4.1 Description:**

This will be an Arduino or Raspberry Pi, it will be a main component of the whole project. All the modules and app connect with it to perform some task.

**2.4.2 Functionality:**

- connects with internet.

- sends the tanks status to the mobile app.

- sends the start and stop command to the pump module.

- retrieves data from module.

**2.4.3 Condition:**

- when starts it connect with the internet.

- whenever the app requested for status, it sends tanks status.

- when pump module sends water sense request, it checks the water level.

- when water level is full, it ignores the sense request. Otherwise, sends the start command to pump module.

- when water level becomes full, sends stop command to pump module.

**3. Non-Functional Requirements:**

* 1. **Architecture:**

**Mobile App:**

- Only for android

**3.2 Programming Language:**

**Mobile App:**

- backend on java.

- frontend on xml.

**Pump module:**

**-** Arduino language.

**Tank module:**

**-** Arduino language.

**4. Constraints:**

**4.1 Time:**

- Not confirmed

**4.2 Technology Required:**

**Pump module:**

* One Arduino
* One wifi module
* One Relay module
* One Water sensor

**Tank module:**

* One Arduino
* One wifi module
* One Water sensor (it may be varying)